as 574 per 1000! Maine and Normandy, notwithstanding their natural productiveness, are conspicuous for the regular diminution of their populations.—On a new form of sclerosis of the cerebral convolutions, by M. Pozzi, with special reference to the cerebral lesions common in insanity.—M. Duval's demand, in the name of a large number of his *confrères*, for the foundation by the Society of an annual Darwinian Conference, was opposed by M. Mortillet in as far as the term Darwinian was concerned, which he proposes to replace by that of *transformist*, arguing that the adoption of the word "Darwinism" is an act of injustice to Lamarck, whose researches entitle him to be regarded as the father of transformism. The question has been referred to the Central Committee.—M. Topinard's explanation of the funereal objects collected in the Philippines by M. Marché's mission.—A discussion on the project for a general manual of ethnographic questions, as drawn up by M. Letourneau for the Society. The plan followed, which is that adopted by the Florentine Society of Anthropology, is criticised at great length by M. Dally, who strongly objects to the phraseology and definitions employed in the questions, and in consequence of his objections M. Letourneau's proposed "Questionnaire" has been referred to a special commission for further consideration.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 14.—Note on a discovery, as yet unpublished, by the late Prof. F. M. Balfour, concerning the existence of a Blastopore, and on the origin of the Mesoblast in the embryo of *Peripatus capensis*, by Prof. Moseley, F.R.S., and Adam Sedgwick, M.A., Fellow of Trinity College, Cambridge.

The late Professor Balfour was just before his death engaged on the preparation of a monograph on the anatomy and development of the members of the genus Peripatus, together with an account of all known species. He left a series of notes, completed MSS., and drawings, which will be edited by the above authors, and issued shortly in the *Quarterly Journal of Microscopical Science*. His discoveries, however, concerning the early embryology of *P. capensis* are so remarkable that the above preliminary note has been communicated at once to the Royal Society.

The discovery is shortly as follows:—That a widely open slit-like blastopore is formed in the early oval embryo of Peripatus, which blastopore, occupying the median ventral line, becomes closed in its centre an anterior portion remaining open as the mouth, whilst a posterior portion apparently becomes the anus. The mesoblast is formed from the hypoblast at the lips of the blasotopre, and makes its appearance as a series of paired hollow outgrowths from the cavity of the archenteron. This most primitive method of the the formation of the mesoblastic somites closely similar to that occurring in Amphioxus and other ancestral forms, is of the greatest morphological significance, and it is especially interesting to find that it survives in an entirely unmodified condition in Peripatus, the adult organisation of which proves that it is a representative of an animal stock of the most remote antiquity.

Mr. Sedgwick, by examining some embryos in Prof. Balfour's collection of material as yet uninvestigated, has been able to conform his results, and also by finding earlier stages to verify certain points in the developmental history which rested at the stage at which Prof. Balfour's inquiry ceased, mainly on inference. A discussion took place, in which Prof. Huxley, Prof. Lankester, and Mr. A. Sedgwick took part. The latter pointed out the close resemblance of the early embryo Peripatus with open blastopore to an actinia, the mesoblastic pouches corresponding to intermesentèrial cavities, and the blastopore to the mouth, and urged that the discovery tended to confirm Prof. Balfour's published theory as to the origin of the bilateralia from the elongation transversely of a disc-like ancestor, the ventral nerve-cords having been formed by the pulling out into long loops of a circum-oral ring.

Prof. Lankester expressed his opinion that the view that the blastopore represented astructure, which in an ancestral form acted as a mouth, must be abandoned. The blastopore is very probably merely an aperture necessarily formed in the process of production of the hypoblast by invagination, and has never had any special function. Prof. Huxley pointed out the essential difference between the peripheral nerve ring of Hydromedusæ and a true circumoral nerve ring.

Geological Society, December 6.—J. W. Hulke, F.R.S., president, in the chair.—Charles Bird, Enoch Cartwright, Henry Eunson, William Johnstone, Henry Liversidge, Henry George Lyons, Joseph Mawson, Horace W. Monckton, Henry Alexander Miers, John Postlethwaite, and Thomas Viccars, were elected Fellows of the Society.—The following communications were read:—Note on a Wealden fern, *Oleandridium* (*Tæniopteris*) *Beyrichii*, Schenk, new to Britain, by John E. H. Peyton, F.G.S.—On the mechanics of glaciers, more especially with relation to their supposed power of excavation, by the Rev. A. Irving, F.G.S. Generally, the author concluded, from mechanical and physical considerations, that far too much *erosive* power has been attributed by some writers to glaciers, and that it is doubtful if the work of actual *excavation* has been accomplished by them at all. The *differential movement* of glaciers he attributed to three causes: (1) cracking and regelation (Tyndall and Helmholtz); (2) generation of heat by friction within the glacier (Helmholtz); (3) the penetration of the glacier by *luminous solar energy*, the absorption of this by opaque bodies contained in the ice (stones, earth, organic germs, &c.), and the transformation of it in this way into *heat*. To this last he attributed the greater differential movement of the glacier (*a*) by day than by night, (*b*) in summer than in winter.

Physical Society, December 9.—Prof. Clifton, president, in the chair.—New members: Mr. H. E. Harrison, B.Sc., Mr. S. T. H. Saunders, M.A.—Prof. G. Forbes read a paper on the velocity of light of different colours. The author concluded from his experiments described to the Society a year ago, that blue rays travel quicker than red rays. M. Cornu had endeavoured to explain this result by peculiarities of the apparatus employed; but this explanation seemed doubtful. It was suggested that the experiments might be repeated with such modifications of the apparatus as would set the question at rest.—Professors Ayrton and Perry read a paper on the resistance of the voltaic arc, or the opposition electromotive forces set up. The electromotive force was measured by a voltmeter connected between the terminals of the lamp. Keeping the width of arc constant the E.M.F. was found to diminish as the current increased. Keeping the current constant, the E.M.F. increased rapidly, at first with an increasing width of arc, and afterwards more slowly. The authors gave a curve representing the change. About 80 volts are required to produce an arc of one-third of an inch. For further increase of arc E.M.F. is therefore proportional to increase of length of arc. The authors also read a paper on the relative intensities of the magnetic field produced by electromagnets when the current, iron core, and length of wire, &c., are constant, but the wire differently distributed. In *a* case the wire was wound uniformly from end to end; in *b* case it was wound from the middle to one end; in *c* case it was wound only at both ends; in *d* case it was wound only at one end. The field was measured along a line running through the axis of the poles beyond the magnet of the above plans; *a* gave the strongest field, except at short distances, when *b* was best.—Professors Ayrton and Perry also exhibited a set of three Faure accumulators in series feeding twenty Swan lamps, each lamp giving over 1 candle power. The electromotive force of each cell was about 2 volts.

Anthropological Institute, December 12.—Mr. M. J. Walhouse, F.R.A.S., in the chair.—Mr. A. L. Lewis exhibited some Neolithic flint implements and flakes found by him at Cape Blanc Nez, near Calais.—A paper by Mr. A. W. Howitt, F.G.S., on the Australian class systems, was read, in which the author discussed and explained the various rules with respect to marriage adopted by several of the native tribes.

SYDNEY

Linnean Society of New South Wales, September 27.—Dr. James C. Cox, F.L.S., &c., in the chair.—The following papers were read:—On a resinous plant from the interior, by K. H. Bennett. Specimens of the gum or resin of this plant, which Mr. Bennett described as *Myoporum platycarpum*, R. Br., were exhibited.—On three new fishes from Queensland, by Charles W. De Vis, B.A. This paper was a description of a new genus of the family Berycidæ, and a species of *Homalogrystes* and *Scolopsis*.—Contribution to a knowledge of the fishes of New Guinea, No. 2, by William Macleay, F.L.S., &c. This is a continuation of a list of the fishes found at Port Moresby by

Mr. Andrew Goldie.—Description of two fishes lately taken in or near Port Jackson, by William Macleay, F.L.S., &c.—On the physical structure and geology of Australia, by the Rev. J. E. Tenison-Woods, F.L.S., &c. This paper dealt at length with all the physical features of the Continent, viz. :—its mountain systems, its inland plains, and the portions intervening between the tableland and the sea, and its river-systems. Secondly the author enumerated the formations which had been recognised in Australia from the fundamental granite up to the recent alluvial. Showing that none of the large groups of rocks which are known in other parts of the world are absent from this continent. References were made to the character of the fossils found, and the soils resulting from the rocks.—On a large cretaceous *Mytilus*, from the Barcoo, by the Rev. J. E. Tenison-Woods, F.G.S., &c. This paper was descriptive of a very large fossil *Mytilus* (*M. ingens*. sp. nov.), which was found in some mesozoic strata in Queensland, of probably Oolitic age. The paper also contained a brief reference to the collections of Mesozoic fossils made in Australia.—Notes on the inflorescence and habits of plants indigenous in the immediate neighbourhood of Sydney, by E. Haviland The author gives an account of his observations on the mode of fertilisation of two species of rutaceous plants common in the neighbourhood of Sydney—*Philotheca australis* and *Boronia pinnata*. In the former species the arrangement of the parts of the flower is such as apparently to specially favour self-fertilisation, but a closer observation shows that this is rendered physiologically impossible by the maturing and discharge of the pollen of each flower before the stigma comes to maturity. A similar phenomenon was observed in *B. pinnata*, and the author suggests that the close opposition of the anthers to the stigma in these species until the pollen is almost ripe, may be designed in order to prevent, to some extent, the access of light and heat, and thus retard the maturing of the stigma until the pollen of its own flower has become discharged.—Note on some seaweeds from Port Jackson and adjacent coast, by E. P. Ramsay, F.L.S.—Mr. W. A. Haswell read a note on some points in the anatomy of the pigeons referred to by Dr. Hans Gadow in a recent paper on the anatomy of Pterocles.—Prof. Stephens exhibited a collection of rocks and fossils illustrating the structure of the Western coal-fields, as explained by Mr. Wilkinson in his map of Wallerawang (1877).

BERLIN

Physical Society, December 1.—Prof. Kirchhoff in the chair.—Dr. Hertz described and exhibited an apparatus he had constructed for demonstration of such weak electric currents as change their direction very often, several thousand times in a second. He called attention to the defects of the electro-dynamometers previously employed for the purpose, and showed that the electric heat-effect could most fitly be used in this case. The new dynamometer consists of an extremely thin horizontally stretched silver wire, the extension of which by heat, produced by the alternating currents, is observed. To this end the wire is, at its middle, wound round a vertical cylinder of steel capable of rotation about its axis, by turning of which the wire is stretched. Each extension of the wire through electric heating turns the cylinder the opposite way to his torsion, and its rotation is observed by means of a mirror and telescope. This dynamometer, as Herr Hertz showed, is only applicable when the currents are weak, and the current reversals are very frequent; that is, precisely in cases where other measuring instruments fail.—Prof. Helmholtz then spoke on his thermodynamic investigations of chemical processes, and their relation to the electromotive force of galvanic batteries, and fully explained his views both on the reversibility of chemical processes and the electromotive forces in batteries; also the experimental verification of these views in a "Calomel battery" composed of zinc, chloride of zinc solution, mercurous chloride, and mercury. The results hitherto obtained in these experiments and considerations, were brought by the author before the Berlin Academy of Sciences in July, and he is at present still engaged with the inquiry.

Physiological Society, December 8.—Prof. du Bois Reymond in the chair.—Prof. Munk read a paper upon two investigations which had been carried out in his laboratory. The first of these was by Mr. M. Preusse, on the Tapetum in the retina of some mammals. It appeared from this chiefly anatomical investigation that a tapetum is always present in the eyes of dogs, horses, and cats; and further that this tapetum is of an irregularly triangular shape and that the greater part of it is situated in the outer and upper quadrant of the retinal surface; so that it is specially impinged upon by the rays that enter the eye from beneath; over the median line and the equator of the retina the tapetum extends only a little, and this inwards and under. The point of entrance of the optic nerve always lies to the inside of the tapetum, which attains its greatest height above the nerve-papilla. In the case of all the animals that were examined, the situation of the tapetum corresponds with the region of most distinct vision. Hence is seen the correctness of Mr. Brücke's view that the tapetum acts as a mirror at a plane behind the cones and rods that are sensitive to light, which sends back a second time through the axes of these cones and rods the rays of light that have already passed through them. This arrangement is of particular service to animals when the illumination is feeble, and it explains how the above-mentioned animals can distinctly see objects lying on the ground even when slightly illuminated, and consequently also at night-time. The second investigation on which Prof. Munk reported was that made by Dr. Karlin on the vaso-motor nerves. It is well known that Prof. Goltz has, from experimental evidence, laid down the doctrine that the blood-vessels have ganglion-cells on or in their walls, which cause the blood-vessels to contract, and which are connected with the central organs by means of vaso-motor nerves which generally dilate but also occasionally contract the blood-vessels. The well-established fact that a section of a nerve, *e.g.* of the sciatic nerve, is followed by an expansion of the vessels in its tract was regarded by Prof. Goltz as the result of the action of the vaso-dilator nerves stimulated by the section, and the after occurring contraction of the vessels as the result of the action of the peripheral vaso-motor centres which in course of time attain the preponderance. This doctrine had received support from Prof. Bernstein's experiments, in which a great dilatation of the vessels was observed to occur, on stimulation of the divided sciatic nerve, in extremities in which contraction of the vessels had been induced by a great lowering of the temperature, and consequently a strong dilatation of the vessels was caused by direct electrical stimulation of the nerve. Dr. Karlin repeated the above experiment, and found its results confirmed only when very strong currents were employed; when, however, weak or moderate stimulation was applied, a contraction instead of a dilatation of the vessels took place. Accordingly the dilatation of the vessels on powerful stimulation is to be regarded as due to a paralysis, and the experimental evidence for the existence of vaso-dilator nerves as inconclusive.

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